

The Advent of AI: Opportunities and challenges

Outline

1) Introduction

Artificial intelligence, with its advent has brought un-imaginable comforts to humans; at the same time, it has forced humans to think about "grave situation; if artificial intelligence continues to grow un-checked.

2) A cursory glance of "Artificial Intelligence" (AI).

3) AI and opportunities towards a better future.

- i) Using AI in the automation of systems.
- ii) Integration of AI in Governance.
- iii) Incorporation of AI for a better healthcare.
- iv) Using AI in improving education.
- v) AI for improved security systems.
- vi) Scope of AI in legal system.
- vii) Harnessing AI's Natural Language Processing.

Date: _____

Day: _____

4) Challenges associated with the advent of AI.

- i) AI arms race among global powers.
- ii) AI, replacing humans in job markets.
- iii) Bias and discrimination by AI.
- iv) Private enterprises developing and owning AI resources.
- v) Security risks brought by AI.
- vi) Ethical dilemma and AI's problem.
- vii) Potential existential threats associated with AI.

5) Approach towards an optimal use of AI and risk mitigation.

- i) Scrutinizing data accessed by AI tools.
- ii) Global co-operation, enacting codes and laws.
- iii) Directing resources towards AI and AI research.

6) Conclusion

Date: _____

Essay

Day: _____

The history of human race stands witness to the fact, that every innovation has brought both opportunities and challenges with it. From early inventions to the revolutionary advancements in information technology, humans have experienced both positive and negative impacts of such innovations in their lives. One such development in modern era, is the "Artificial Intelligence". Artificial intelligence, with its advent has brought unimaginable comforts to humans; at the same time, it has forced humans, to think about grave situation; if artificial intelligence continues to grow unchecked. AI has a huge part to play in increasing performance of ~~our~~ health, legal, and education systems; improvement of security paradigm; integration of AI in governance; automation of existing systems. One expects artificial intelligence to provide path breaking success in different walks of life; at the same time one cannot ignore the challenges that have emerged with the advent of AI: global powers getting involved in an AI based arm race; AI's bias and discrimination; private enterprises owning major artificial intelligence assets; these are some of major concerns. So, Artificial intelligence, with its advent has ^{provided} human beings with unimaginable comforts and

Date:

Day:

benefits; however, it has also confronted human race with the most serious of challenges; some of which have potential to become existential threats. Now is the time that governments and global organizations should take steps to harness its fruits and mitigate its harmful impact. AI itself is a tool, however, it has potential to make life either hell or heaven; depending on how humans use it; as once mentioned by Elon Musk.

"It will be best ever or worst ever thing for humanity." (Elon Musk)

If one wants to harness benefits of AI, while staying immune to its hazards, one must know the concept of AI. The term "AI" or "Artificial Intelligence" was first used in 1950s. Machine Learning (ML), can be considered as the discipline from which AI is originated. ML deals with developing mechanisms which enable computers to differentiate among different patterns; evolution of ML over the years has resulted in emergence of artificial intelligence. Artificial intelligence, refers to ability of a

Date: _____

Day: _____

computers or robot-controlled by computers to perform tasks that are naturally performed by human beings. At this point of time artificial intelligence has matched just a few aspects of human intelligence. AI has evolved over a period of time, that evolution has diversified the nature and capability of different tools of AI, being used. For instance, Tesla's AI, used in auto driving mode is different than many chatbots being used; the corner stone in AI movement, however, is the invention of "Chat GPT", the chat GPT, has the ability to create content: writing emails, essays, etc. It can also solve complex mathematical problems; these days its intelligence is being tested, by making it to attempt various examinations of different professional courses. The highlight of chat-GPT is, it being a generative type, which means it keeps learning from its mistakes. The advent of generative AI has sparked the debate about the future aspects prospects of AI. The prime focus of this debate is to maximize the benefits while minimizing the risks associated with AI.

Date: _____

Day: _____

The debate, whether AI has brought with it more opportunities or more challenges; can only be settled by considering both the good and bad aspects of artificial intelligence. As, it is better to start with positive aspects, so automation of the system is one of such examples. In many walks of life, many instances of automated systems can be found - Siri and Alexa, introduced by tech giant companies have automated many house-hold tasks, similarly customer support systems, computer aided manufacturing are also the manifestations of automation of existing system. With the advent of generative artificial intelligence one may expect its integration in mass transit system, which would result in a railway or metro bus system that will be completely controlled by AI, and will not require any human input. This would result in a more efficient, safe and faster rapid transport system. In near future many existing systems are expected to be automated for more efficiency.

As AI brings to the table, unparalleled standards of efficiency, the integration of artificial intelligence in governing systems can work wonders for the betterment of public. In order to integrate AI, in governance a basic framework is required to define the extent up to which it may play its role. Blocs, like G-7 and European Union have already started to contemplate on this aspect of AI. If, in near future, such integration is achieved AI will fast track decision making, implementation and execution by many folds. AI can perform data organization and data analysis, thus, making the job easier for decision making. Routine decision making can also be assigned to AI, resulting in better and faster governance.

Similarly, another sector in which AI has a big role to play, is health sector. One can already observe what AI is capable of doing when incorporated in health sector. PATH AI, is one such tool; it is an AI bot; solely, developed for health sector;

Date: _____

Day: _____

it employs algorithms in diagnosis; making diagnostic process more efficient. These days, AI is being used in reading X-ray reports, robotic surgeries and diagnostics, and one can see how AI has resulted in better health facilities. The scope of AI in this sector can be increased for further improvement in health sector. Schedules, appointments, and maintenance of record can be automated using AI; which may involve AI setting schedule for surgeries, appointments; notifying patients and doctors about the appointment or surgery. AI can cater more people in less time, thus, reducing burden on health system and making it to perform well.

Another sector of prime importance is the education sector. United Nations Educational Scientific and Cultural Organization (UNESCO) has emphasized on integration of AI in education. AI is already performing tasks related to grading in some countries of world, but

UNESCO sees its role far beyond grading; it aims at personalization of the curriculum using AI. UNESCO has already conducted many seminars, so that the teachers become familiar with AI, and use it to design a curriculum for each student, to meet the requirements of every student. AI can also solve the staffing problem in education system, as it can perform many tasks that are mostly performed by humans, resulting in utilization of resources in productive ways, and leading to development of education sector at an un-precedented rate.

As AI is producing un-imaginable results in every walk of life, its contribution in ensuring the safety of the citizens of state, cannot be ignored. Countries like China, USA, etc. have already incorporated it in their ^{surveillance} ~~surveillance~~ systems.

Security camera these days are able to recognize a person's face. Owing to their intelligence, these cameras can differentiate among persons on the basis of face recognition. Through this innovation countries are able to keep

an eye on elements that may seem as a threat to ^{the} state, or safety and security of people. Similarly AI is also being used to thwart cyber attacks, as it has ability to recognize the pattern of harmful software and neutralize them. So, one cannot ignore the contribution of AI in keeping people safe.

Along with maintaining safety, AI can ^{also} play important part in upholding and protecting ^{the} basic human rights, when it is incorporated in legal system. AI can be used in multiple ways, in order to provide speedy justice to public. Algorithms can be assigned tasks like classification and prioritization of cases; assign assignment of cases to judges; making decisions based on the basis of previous experience helping out judges to make an decision. While shedding light on incorporation of artificial intelligence Dr. Shahid Hussain Kambayya, a scholar at Singapore University of Management has mentioned in his article - "Innovation in AI: scope in justice sector of Pakistan - has mentioned

Now countries like China, UK and Canada are using AI for better results. According to Dr. Shahid Hussain Kamboh, China has already implemented AI as ^{an} adjudicator; UK is using AI in online dispute resolution; Canada has employed AI to review all the decisions. In Pakistan, the judicial and legal system is under-performing because of the scarcity of resources. Artificial intelligence, however, can be an option to enhance the performance of the system, as it has done in other countries.

In addition to all above-mentioned applications, the "Natural Language Processing", a domain of artificial intelligence, has played an important role in growth of search engines and information technology. This technology assesses language, text, grammar, sentence structure etc., to provide optimal results for user's search.

Google, Facebook etc., are employing this along with chatbots which personalise search according to users. Some companies are using "NLP" in their customer support sections and in daily "Alexa" can be seen as a manifestation

Day: _____

"Natural Language Processing". So, incorporation of AI in customer support section, and sections of departments involved in data gathering will fast track many operations. Thus, resulting in faster and more efficient provision of services.

Although AI has brought many positive changes in human life, one cannot ignore the risks that it has brought with its advent. One such risk or challenge is, involvement of countries in "AI Arms Race". Big powers like China, USA and Russia are treating AI as a new war front, and trying to leap frog others in attempt to take this technology to a new level for defence. "AI Arms Race" includes competition in automation of traditional weapons, and development of advanced tools of cyber war. The major concern that arises with situation, is that these countries are pushing harder to attain more advanced tools, while ignoring all ethical and legal grounds, that prohibit advancement of a technology to such an extent that it may become detrimental for humanity. So, absence of any rules and laws in "AI Arms Race" is one such challenge

must be addressed as soon as possible.

Similarly, AI has posed the challenge of job displacement to many professionals. Artificial intelligence, has the potential and ability to learn from its past experience; this ability makes it an eligible candidate for many jobs. Earlier, it was thought that AI would replace jobs only related to semi-skilled field, but the advent of "Generative Artificial Intelligence" has completely changed this scenario. This modern type of AI can not only write coherent text and emails, but also solve complex problems. Owing to these capabilities, AI has risked millions of employees to lose their jobs, as artificial intelligence has the ability to solve complex problems along with performing clerical work. A report by "World Economic Forum" suggests that by 2027, AI will result in 14 million job losses - the new jobs created, by that time by AI use expected to be around 69 million. It will relieve 83 million of their jobs, so creating an overall deficit of 14 million jobs. This job displacement will lead to further unemployment, which is already

uncontrolled in many countries.

Another major concern is bias and discrimination; that manifests in some of the actions performed by AI chatbots. As, these chatbots learn from all the data, that is available to them; such data may be present on internet; chatbots coming in contact with un-filtered data on internet leads them to learn bias and discrimination. Many such case have been reported in which AI chat-bots have shown discrimination on the basis of gender, race, and religion. One such example is Amazon's hiring algorithm, this algorithm was found to be biased against women candidates. As majority of applicants were male, so it learnt that to be a male was eligibility criterion, and it rejected the applications of female candidates. So, discrimination and bias displayed by AI are serious concerns and ^{they} need to be resolved.

Among many concerns that human race is facing, one cannot ignore the fact that most of the advanced AI tools are developed, maintained and owned by private companies. This situation

Date: _____

Day: _____

indicates towards the fact "AI is a power concentrated in a few hands". This situation is concerning as none of the companies are considered sovereign entities, however, these organizations are far more influential than many ~~countries~~ countries. So, even if an international convention is established for the control of negative impacts of AI, bringing these companies on the table is a big issue. Furthermore, governments have been caught off-guard in policy making on AI, so these companies have established their own rules, resulting in availability of this tool to many people who may be deemed un-authorized to use such ~~tools~~ tools. One such example is that one does not need any permit or license to use this technology whether he be a scientist or a terrorist. If one has money to pay for the technology, he may use it for whatever purpose he wants. Thus making ^{ownership of AI} a major concern.

As to use AI, one does not ~~require~~ any permit, one may just pay the subscription, or ^{buy} such machine to use it; criminals and anti-social entities are also using AI to achieve their targets.

Date: _____

Day: _____

Use of AI, but by terrorist organisations and cybercriminals is a major concern.

Some terrorist organisation have already employed drone technology in their activities: Houthis used drones to attack an oil refinery in Saudi Arabia, in 2019. If they manage to, somehow integrate modern generative AI to weapons, then the threat will increase by many folds. Similarly, the ability of AI to adapt and ^{to} easily recognize complex patterns make it a potent force against any cyber-security system in this world; so making data of many people vulnerable to hacking, spying, etc. So, incorporation of AI in criminal activities is alarming.

One can not ignore the ethical dilemma of artificial intelligence, while considering different challenges posed by AI. Ethical dilemma refers to a situation in which choices and obligations in specific situations do not allow for ethical outcomes. The tools of artificial intelligence have been designed, while keeping logic in consideration, and ethical consideration are ignored completely.

Date: _____

Day: _____

So, many AI tools in a practical situation of decision making only consider logic while ignoring ethics; humans on the other hand, employ both logic and ethical considerations in decision making. This situation can better be explained by considering an example. Breaching one's privacy is not considered ethical in human society, and such act is considered immoral, while an AI bot by breaching one's privacy is just fulfilling the task at hand. Morality does not exist for chat bots. So, such situation may lead to many social and cultural problems.

Lastly, many experts claim that artificial intelligence is a potential existential threat to humanity. Many scholars are of the opinion that, just like nukes, AI may one day gain the ability to wipe mankind from the surface of the planet. Scientists have divided the evolution of AI in different phases. As of now AI is in its "Limited memory AI" phase in this phase AI tools are able to learn and adapt on the basis of past experience. Scientists, however, argue that the most advanced stage is

Date: _____

Day: _____

in this evolution is yet to arrive: Self-Aware AI. This stage of AI is expected to surpass human intelligence. Experts expect self-realization of AI at this stage. After self-realization AI ^{can} emerge as biggest rival that mankind has ever faced. This rivalry may end at the extermination of one of the two rivals. Indeed, AI may become an existential threat to humanity.

Nevertheless, AI is delivering many positives along equally bad negative. Now, it is duty of humans to maximize its benefits, and to minimize its adverse effect. In this regard many efforts are secured. One such effort is to ~~scrutinize~~ scrutinize data that AI tools used in decision making. Such data should be made free from biases, hate-content, derogatory and controversial information. Adopting this strategy AI will be free from bias and discrimination. A committee should be formed; which may regulate this scrutiny after consultation with experts belonging from different walks of life. This will lead to an unbiased AI.

involved in decision making.

As AI is a phenomenon; effects of which are felt across the globe; to regulate it; a co-operation at global level is essential. Organizations like G-7 and European Union Parliament have already taken a lead, in their bid to harmonize AI with human values. UN should look to frame a global treaty; make all of its members to sign this treaty. The main goals of the treaty should be to regulate the use of AI; blocking access to criminal entities; providing big tech organizations right of representation; so that those companies become responsible; enacting global statutes to make sure that its benefits are enhanced, and harmful impacts are nullified. This will result in AI contributing towards the betterment of public.

Along with adopting above mentioned strategies, states must focus towards on directing resources towards AI and AI research. A country like Pakistan, especially, can benefit from AI up to a great length. By investing on AI

Date: _____

Day: _____

Pakistan can groom thousands of AI experts contributing in different walks of life. Similarly investing on research will provide mechanisms to regulate and control AI, which will allow humans to have an edge over AI. Similarly using AI such new fields can be established which ^{may} increase the net human employment rate. Basically better AI, and well maintained AI will lead to overall improvement in one's living standard, which is only possible by provision of resources to AI and AI research.

After taking in consideration; different aspects of AI; one realizes that AI is one of the most momentous and historic innovations ever, the world has witnessed. Back in 20th century

AI was just a desire, or a wish, but with the turn of century AI began to make people realize its existence. These days AI is playing an important role in helping out man, in different disciplines. All major disciplines like education, health, security, and governance are using AI to improve their efficiency, and many positive contribu-

Date: _____

Day: _____

butrons are yet to come. But, at the same time AI has brought, with it, some challenges and risks with it in the form of job displacement, ethical concerns, etc. However, with positive approach; enactment of laws; regulation of AI; investment in AI; it may become a total lead towards prosperity, progress and a bright future.